EXECUTIVE SUMMARY

Overview

Erosion of the beaches and coastal bluffs in the San Diego region has occurred at a faster than natural rate over the past several decades. As a result, the incidents of wave-induced flooding and structural damages have increased significantly in the last 10 to 20 years from a combination of factors, and these incidents are projected to increase in the future based on the Coast of California Storm and Tidal Waves Study (CCSTWS) conducted by the U.S. Army Corps of Engineers (USACE 1991). Without the historic replenishment from inland sand sources, shoreline erosion has narrowed the beaches and depleted them of sand, thus increasing the vulnerability of coastal bluffs to erosion from waves. In addition, water infiltration from rainfall and landscape irrigation has contributed to bluff top erosion, and has been a factor in bluff failures (e.g., slumping, block falls) in localized areas. These events have resulted in the loss of human life and significant damages to public and private property. During major storm events, waves and rocks have overtopped the revetments built to protect the low-lying areas, causing flooding and other damages to local businesses, including the closure of coastal Highway 101, an emergency route identified by the Office of Homeland Security.

In response to the growing concerns for protecting property and reestablishing natural coastal resources, the U.S. Army Corps of Engineers Los Angeles District (USACE or the Corps) undertook studies and investigations to understand the primary mechanism of bluff erosion in the study area. With this information, the Corps developed potential solutions, resulting in the Encinitas and Solana Beach Shoreline Protection Project. This project proposes to protect bluffs from erosion by wave attack by one or more methods: dredging and placement of sand and/or construction of notch fills or seawalls on potential receiver sites in the San Diego region. This joint draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was prepared to address the potential environmental consequences of the Encinitas and Solana Beach Shoreline Protection Project. This document has been prepared by the Corps (Federal lead agency) in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4332 [1994], as amended) in accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 C.F.R. §§1500-1508) and USACE regulations implementing NEPA (32 C.F.R. Part 775). The Cities of Encinitas and Solana Beach are local sponsors and co-lead agencies for this EIS/EIR, which has been prepared in accordance with the California Environmental Quality Act of 1970 (CEQA) statutes (Cal. Pub. Res. Code, § 21000 et seq., as amended) and implementing guidelines (Cal. Code Regs., Title 14, § 15000 et seq. [1998]).

The objective of the Encinitas and Solana Beach Shoreline Protection Project is to formulate and evaluate an array of feasible alternatives and identify the one that most effectively reduces risks and damages associated with bluff erosion and storm-related damages while complying with local, state, and Federal environmental laws and regulations. Four alternatives evaluated in this document include: (1) the No Action Alternative; (2) Alternative 1 -- Beach Nourishment; (3) Alternative 2 — Beach Nourishment with Notch Fills; and (4) Alternative 3 –- Seawall with Notch Fills.

Study Area

The study area is located along the central coast of San Diego County, California, and includes the shoreline encompassing the Cities of Encinitas and Solana Beach (Figure 1.1-1). The coastal shoreline within the study area is approximately 13 kilometers (km) (8 miles [mi]) long and is bounded by the City of Carlsbad to the north and the City of Del Mar to the south. The communities of Cardiff-by-the-Sea, Encinitas, Leucadia, Olivenhain, Solana Beach, and an unincorporated area of San Diego County are included in the study area. The majority of the shoreline consists of narrow sand and cobble beaches backed by coastal bluffs. One stretch of coastline within the community of Cardiff is low lying and fronts the San Elijo Lagoon.

EIS/EIR Objectives

The purpose of this EIS/EIR is to provide decision-makers and the general public with an assessment of the potential environmental impacts associated with alternative strategies for managing the coastline. This document is also intended to provide information to those agencies whose discretionary approvals must be obtained for project implementation. The objective of the EIS/EIR is to evaluate the range of coastal management strategies or alternatives available.

The National Economic Development Plan, the Least Environmentally Damaging Practicable Plan, and the Proposed Action

Four alternatives have been developed for this EIS/EIR and are considered at an equal level of detail so decision-makers and the general public can make a fully informed decision regarding coastline management. The No Action Alternative (Future without Project condition) is defined as “no Federal Project occurring.” Alternative 1 (Beach Nourishment) would include placing sand on the beach to increase beach width, whereas Alternative 2 (Beach Nourishment with Notch Fills) would include a combination of sand replenishment and notch fills for toe protection. Alternative 3 (Seawall and Notch Fills) relies on the construction of seawalls along the coastline for shoreline protection. A more detailed description of each alternative is provided below.

To determine the National Economic Development Plan (NED), the Corps examined the residual damages and the recreational benefits of each of the alternatives. The plan with the greatest net benefits is the NED Plan. Based on the cost-to-benefit ratio calculated from the costs and storm damage reduction benefits associated with the alternatives, the NED plan is Alternative 2, Beach Nourishment with Notch Fills.

NEPA and the Section 404(b)(1) Guidelines to the Clean Water Act allow the applicant to take engineering, cost, environmental, and logistic factors into consideration when selecting the least environmentally damaging "practicable" alternative; to successfully meet the requirements of the alternatives analysis and NEPA requirements, the analysis must show that the least environmentally damaging alternative has been selected. In this manner, NEPA and Section 404 permitting process are intricately interrelated. A comparison of the direct and cumulative impacts was made for all alternatives, and the least environmentally damaging practicable alternative has been determined to be Alternative 2, Beach Nourishment and Notch Fills.

The proposed action is Alternative 2, Beach Nourishment with Notch Fills. The propose project will place approximately 938,000 m^2 (1,226,900 yd^3) of dredged sediment from two offshore borrow sites along 4.6 km (2.9 mi) of shoreline; it will also fill incorporate notch fills (filling notches in the bluff until the fill is flush with the bluff). The project may begin in 2008. The construction schedule is addressed in Chapter 3.4. All of the proposed borrow sites are surrounded by ocean water; the primary recreational activities occurring nearby are boating, sailing, and diving pursuits.

Project Alternatives

No Action Alternative

The No Action Alternative serves as the baseline by which other alternatives may be judged and compared. The No Action Alternative is defined as "no Federal Project occurring." Under this scenario, existing conditions and practices are assumed to continue in the future.

Major assumptions associated with the No Action Alternative include the continuation of emergency permits and piecemeal protection over a 50-year project life. No significant beach replenishment activities would occur within the vicinity except for those associated with routinely authorized maintenance dredging, which would not have any significant long-term impact on the shoreline in the study area (USACE 2003). Under this alternative, beaches will experience minor seasonal fluctuations as a small amount of sand moves onshore and offshore, but in general, denuded beach conditions will persist.

Alternative 1 – Beach Nourishment

Under Alternative 1, sand would be dredged from previously surveyed and mined offshore borrow sites (designated MB-1 and SO-6 during the SANDAG study[1]) and placed directly onto the beach in two segments. Construction specifications will control where the sand is mined and where it is placed, but the dredging contractors bidding on the job will select and define the methods and equipment.

Segment 1 (further divided into Reaches 3, 4, and 5) extends 3.2 km (2.0 mi) from the 700 block of Neptune Avenue to Swami Reef; Segment 2 (Reaches 8 and 9) stretches 2.3 km (1.4 mi) from Table Top Reefs to the southern limit of Solana Beach. Figure 3.4-1 shows the locations of the reaches in the study area. The general process for sand dredging, delivery, and dispersal is similar for both borrow sites and for both receiver sites. Segment 1 consists of Reaches 3, 4, and 5; Segment 2 consists of Reaches 7 and 8.

Alternative 1 includes initial beach nourishment as well as a 5-year replenishment cycle over a 50-year project life. Initial beach fill would require approximately 732,000 square meters (m^2) (957,400 cubic yards [yd^3]) for Segment 1 and 412,800 m^2 (539,900 yd^3) for Segment 2, for a total of 1,144,800 cubic meters (m^3) (1,497,300 yd^3). Volumes required for beach placement do

[1] The SANDAG study refers to the San Diego Regional Sand Beach project which the San Diego Association of Governments implemented in 2001. That project placed 1.6 million m^3 (2.1 million yd^3) of sand on 12 San Diego County beaches ranging from Oceanside to Imperial Beach. Four of the beaches were located within the study area: three in Encinitas and one in Solana Beach.

not include the 10 percent loss due to construction activities, which occurs primarily offshore and nearshore. Renourishment would occur every 5 years on the average and would require approximately 288,300 m³ (377,100 yd³) for Segment 1 and 171,000 m³ (223,700 yd³) for Segment 2; a total of 459,300 m³ (600,800 yd³) per renourishment event.

Two possible dredging methods considered for this project include the use of either hopper dredge or a cutterhead/suction dredge. For both the hopper and cutterhead methods, sand is combined with seawater as part of dredging process until it reaches the consistency of slurry. It is then conveyed to the beach either via pipeline or a combination of hopper dredge and pipeline.

Existing sand at each receiver site is used to build a small, "L"-shaped berm to anchor the sand placement operations. The short side of the "L" is transverse to the shoreline and is approximately the same width as the design beach for each segment. The long side is parallel to the shore, at the seaward edge of the design beach footprint. The long side is initially approximately 60 m (200 feet [ft]) long. For Alternative 1, the short side of the of "L" is typically 70 m (230 ft) long in Segment 1 and 60 m (200 ft) long in Segment 2.

When the slurry is pumped onto the beach, it is placed into the angle of the "L" between the berm and the bluff toe. As filling progresses the berm is continuously extended to maintain its 60-m (200-ft) length. As the material is deposited behind the berm, the sand would be spread using two bulldozers and one front-end loader to direct the flow of the sand slurry and form a gradual slope to the existing beach elevation. For each receiver site, berm construction may be adjusted from the design requirements during fill placement depending on actual field conditions. The measurements indicated for the width of the berms are the initial placement widths. The berms would be subject to the forces of waves and weather once constructed, and will eventually settle down to a natural grade for the beach. Typical cross-sections of the berm construction in Segment 1 and Segment 2 are shown in Figures 3.4-3 and 3.4-4 respectively.

Implementation of Alternative 1 (sand dredging, placement, and dispersal for both initial placement and follow-on replenishment cycles) would occur on a 7-day, 24-hour (24/7) basis by operating three shifts per day. Two days will be required to set up the pipeline leading from the dredge (or monobuoy, depending on the selected dredging method) to the shoreline. The contractor typically assembles two sets of pipeline to avoid delays associated with moving and setting up the pipelines as each section of sand placement is completed. Sand discharge and grading is therefore continuous as long as the dredge is operating.

Alternative 2 – Beach Nourishment with Notch Fills

Alternative 2 includes the use of notch fills, constructed of erodible concrete, at the bluff base prior to placement of a 60-m (197-ft) wide beach fill in Segment 1 and a 30-m (98-ft) wide beach fill in Segment 2. Beach replenishment activities for Alternative 2 do not differ substantially from Alternative 1, except that the design width and dredge volumes are reduced in Alternative 2. Initial fill would require 628,000 m^3 (821,400 yd^3) for Segment 1 and 310,000 m^3 (405,500 yd^3) for Segment 2, for a total of approximately 938,000 m^3 (1,226,900 yd^3). Renourishment would occur every 5 years on the average and would require approximately 261,000 m^3 (344,375 yd^3) for Segment 1 and 140,000 m^3 (183,375 yd^3) for Segment 2, for a total of 401,000 m^3 (524,750 yd^3).

Notch fill activities in Segments 1 and 2 would require approximately 10 to 15 trucks of concrete per day. The total volume of concrete required to fill notches in the bluff base would be determined by the specific site conditions at the time of project construction. However, based on an estimate of approximately 0.25 km (0.1 mi) of bluff protection, approximately 4,600 m^3 (6,000 yd^3) of concrete would be needed, which will be provided by a cement truck in the work area. The quick-drying erodible shotcrete gunite is spread using a high-pressured hose, and approximately 30.5 linear m (100 ft) per day and can be covered, assuming 6 m^3 (8 yd^3) of shotcrete can be produced in each cement truck load.

During low tide, the area immediately in front of the notch is cleared of sand. The erodible concrete is mixed with a quick dry additive, and a layer of concrete approximately 15 centimeters (cm) (6 inches [in]) thick is sprayed along an area of bluff approximately 30.5 linear m (100 linear ft). The quick-drying concrete sprayed at the beginning of the area would be dry once the entire area has been sprayed, and an additional 15 cm (6 in) will be sprayed on top of the first layer. This process would be repeated until the notch is filled and is flush with the face of the surrounding bluff.

The exact sequence of notch fills and beach fills would be up to the contractor, depending on site conditions, equipment, and access. Should the contractor opt to do the notch fill after beach fill, additional sand would have to be cleared from the bluff face prior to the application of concrete; this includes sand originally present at the bluff face plus any additional sand from beach fill activities. The work would, however, proceed 24/7 since the bluff face would be protected from water inundation by the nourished beach. Should the contractor opt to do the notch fill before beach fill, smaller volumes of sand material would have to be removed. However, work could only occur approximately 2 weeks per month and 6 hours per day due to tides. This would be done concurrently, but not co-located, with beach replenishment. Beach fill operations would occur on a 24/7 basis (as previously described in the Alternative 1).

Alternative 3 – Seawall with Notch Fills

Alternative 3 would protect the bluffs with seawalls and incorporating notch fills where needed. The proposed seawall plan consists of a combination of notch fills (described above) and either a continuous poured in-place or a shotcrete wall panel embedded into bedrock and anchored deep into the bluff with tie-back rods.

Due to access limitations and engineering constraints, the only feasible seawall design for the study area is a tie-back shotcrete or poured-in-place wall, depending on the required height of the seawall structure. For Reaches 3, 4, and 5 in Segment 1, the walls would be poured-in-place concrete walls (Figure 3.4-13), and for Reaches 8 and 9 in Segment 2, shotcrete walls would be constructed (Figure 3.4-14). "Weep holes" at the base of the walls spaced at regular intervals would drain ground water that may otherwise be trapped behind the walls and cause damage to the structure. Two crews will work simultaneously in each segment, for a total of four crews comprising about 30 personnel. Required equipment for the two crews in Segment 1 includes two backhoes, two high-pressured nozzles for shotcrete spreading, two rubble tire hydraulic cranes, and hand-held drilling equipment. Construction activities in Segment 1 would require approximately 20 to 30 concrete truck trips per day.

In Solana Beach (Segment 2), due to the geological formation that consists of a 3-m (10-ft) thick sand layer beginning at an elevation +7.6 m (+25 ft) mean lower low water (MLLW), a continuous shotcrete wall with a top elevation at +12 m (+40 ft) MLLW as well as tie-back anchors embedded deep into the bluff is proposed for Reaches 8 and 9. The thickness of the shotcrete wall is 76 cm (30 in) on the bottom, gradually tapered off to 0.5 m (18 in) at the top. The wall is embedded 0.6 m (2 ft) into the bedrock at the base and anchored deep into the bluff with tie-back rods. Figure 3.4-14 illustrates the cross-section view of the wall proposed for Reaches 8 and 9. Approximately 1,396 m (4,580 ft) of seawall would be required in Segment 2.

Site constraints due to high tides will limit the seawall construction period in Segment 2 to approximately 2 weeks per month and 6 hours each work day. Total construction time is estimated at 2 years with activity occurring only between April and September.

Affected Environment

This EIS/EIR provides a description of the existing environmental conditions in the project areas, describing existing conditions for the following resource categories: topography, geology and geography, oceanographic and coastal processes, water and sediment quality, biological resources, cultural resources, aesthetics, air quality, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. Hazardous Materials was eliminated from further review after determination that no hazardous materials are present in the project area.

Environmental Consequences

Table ES-1 summarizes the potential effects under all three Alternatives and the No Action Alternative. A significant impact to air quality has been identified under Alternatives 1 and 2; a significant impact to aesthetics has been identified under Alternative 3.

Cumulative Impacts

California guidelines for implementing CEQA require a discussion of significant impacts resulting from incremental effects considerable significant when viewed in combination with the effects of "past, present, and probably future projects," or in relation to "a summary of projections contained in an adopted general plan or related planning document" (Cal. Code. Regs, Title 14, § 1506(c) and § 15130(b)(1)(A)(B)). Federal guidelines for implementing NEPA define a cumulative impact as one that would result from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions (40 C.F.R. § 1508.7).

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
TOPOGRAPHY AND GEOLOGY			
Initial placement of beach fill is not expected to result in long-term significant impacts on topography and geology. To maintain adequate shore protection additional sand replenishment is required every 3- 5 years for the life of the project. This is not expected to result in long-term significant impacts to the topography and geology. No significant topography and geology impacts are anticipated to occur to the dredge borrow sites with implementation of Alternative 1. Impacts from renourishment activities are expected to be similar as stated above.	Target width under this alternative would be reduced. Impacts would be similar for those described for Alternative 1 for the beach fill component and renourishment. Additional toe protection would be provided by filling notches that threaten bluff stability. Under this alternative, there is a delay of bluff erosion due to the notch fills. This is not expected to result in long-term significant impacts to the topography and geology. The same borrow sites as Alternative 1 would be used under this alternative but at smaller quantities. No geological impacts are expected at the borrow sites.	The seawalls would reduce bluff erosion for a period of time of at least 50 years, with maintenance. This is not expected to result in long-term significant impacts to the topography and geology.	No significant impacts would occur to topography and geology; however, the receiver beaches and bluffs would continue to erode undeterred and the project benefits would not occur.
OCEANOGRAPHY AND COASTAL PROCESSES			
Initial placement of beach fill is not expected to result in long-term significant impacts on oceanographic and coastal processes. To maintain adequate shore protection additional sand replenishment is required every 3- 5 years for the life of the project. This is not expected to result in long-term significant impacts to the oceanographic and coastal processes. No significant oceanographic impacts are anticipated to occur to the dredge borrow sites with implementation of Alternative 1. Impacts from renourishment activities are expected to be similar as stated above.	Target width under this alternative would be reduced. Impacts would be similar for those described for Alternative 1 for the beach fill component and renourishment. Additional toe protection would be provided by filling notches that threaten bluff stability. Under this alternative, there is a delay of bluff erosion due to the notch fills. This is not expected to result in long-term significant impacts to the oceanographic and coastal processes. The same borrow sites, as Alternative 1 would be used under this alternative but at smaller quantities. Impacts from renourishment activities are expected to be similar as stated above.	The seawalls would reduce bluff erosion for a period of time of at least 50 years, with maintenance. This is not expected to result in long-term significant impacts to the oceanographic and coastal processes.	No significant impacts would occur to oceanographic and coastal processes; however, the receiver beaches and bluffs would continue to erode undeterred and the project benefits would not occur.

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
WATER AND SEDIMENT QUALITY			
None of the fill material would exceed the criteria established in the California Ocean Plan for bacteria, dissolved oxygen, contaminants and sulfides, nutrients, or pH and there would be no significant impacts associated with placement of fill material at the receiver sites. Turbidity associated with construction is expected to be short term and localized. Impacts as a result of turbidity are not expected to result in long-term significant impacts on water quality. Dredging at the borrow sites would not result in significant impacts to water quality at any of the borrow sites. Impacts from renourishment activities are expected to be similar as stated above.	Impacts would be similar for those described for Alternative 1 for the beach fill component. Impacts would be similar for those described for Alternative 1 for the dredging component. The same borrow sites would be used under this alternative but at smaller quantities. Additional toe protection would be provided by filling notches that threaten bluff stability. Notch fill construction activities are not expected to have adverse water quality or sediment impacts. Impacts from renourishment activities are expected to be similar as stated above.	Seawall and notch fill construction activities are not expected to have adverse water quality or sediment impacts.	As no dredging or replenishment activities are proposed under this alternative. No change to water quality or sediments would result.
BIOLOGICAL RESOURCES			
Direct impacts to surfgrass, reefs, kelp, and other resources will be avoided during placement of the sand material and no direct impacts are anticipated. Indirect impacts to these resources from longshore transport of fill material are not expected. Initial fill material will bury the existing benthic community. Due to rapid recolonization of benthic communities, impacts are expected to be short term and insignificant. Placement methods and monitoring would ensure that there would be no	Impacts associated with beach fill activities and renourishment would be similar for those described for Alternative 1. The same borrow sites would be used under this alternative but at reduced quantities. Notch fill construction activities are not expected to have adverse impacts on-site biological resources.	Seawall and notch fill construction and maintenance activities are not expect to have adverse impacts to biological resources.	No change to onshore, nearshore or offshore biological resources would occur. There would be no opportunity to improve shore bird and grunion habitat in currently cobble beaches.

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
significant impacts to spawning grunion or grunion eggs during construction and renourishment. No significant indirect impacts to biological resources are expected due to turbidity. Impacts associated with placement of fill material to shorebird foraging will be temporary and insignificant. No significant impact to fish species is likely to occur. No impacts to marine mammals and threatened and endangered species are expected. Impacts to EFH are expected to be minor and insignificant. Impacts from renourishment activities are expected to be similar as stated above.			
CULTURAL RESOURCES			
There are no known cultural resources in the Area of Potential Effects (APE). No significant impacts are anticipated from construction or renourishment activities.	There are no known cultural resources in the APE. No significant impacts are anticipated from construction, renourishment, or maintenance activities.	There are no known cultural resources in the APE. No significant impacts are anticipated from construction or maintenance activities.	Significant impacts to cultural resources would occur if these resources are present on a bluff that collapses due to a lack of protection.
AESTHETICS			
Construction impacts would be short term and insignificant. Long-term impacts from a wider beach are expected to have beneficial impacts. The borrow sites are located far off shore; therefore, potential aesthetic impacts associated with dredging at the borrow sites are insignificant.	Impacts would be similar for those described for Alternative 1 for the dredging and renourishment component. Impact from the construction of the notch fills are short term and insignificant.	Significant impacts to aesthetics due to the presence of the seawall are expected to occur.	Under the No Action Alternative, the beaches would not be enhanced nor would bluff erosion be alleviated. Where there are visible cobbles they would remain and where the beach overall is narrow it would not be widened.

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
Impacts from renourishment activities are expected to be similar as stated above.			Adjacent residents and beach users would not experience disturbance during construction or views of the pipeline; however, they would not experience the benefits of more scenic beaches.
AIR QUALITY			
The sand would be moist and the potential for dust generation would be very low; impacts would be less than significant. Emissions of CO, ROC, SOx and NOx from dredge and construction equipment are expected to be significant. Impacts from renourishment activities are expected to be significant.	Impacts from beach replenishment and renourishment would be similar for those described for Alternative 1 and are expected to be significant. The notch fills construction is not expected to have any significant impacts to air quality.	Seawalls construction is not expected to have any significant impacts to air quality.	As no construction would occur, no air quality impacts would result.
NOISE			
Noise from dredging and placement of fill material activities would be indistinguishable from background. No impacts are expected. Grading on the beach during the day is not expected to exceed local noise ordinance limits. Impacts will be considered insignificant. Nighttime and weekend work at receiver beaches would exceed local ordinance limits and be performed under variance. Residents of homes near the receiver sites would be notified prior to the work, and adverse nighttime noise events would occur for no more than three consecutive days within 200 ft of individual homes. Nighttime noise impacts would be short term and insignificant.	Impacts from beach replenishment and renourishment would be similar for those described for Alternative 1, however beach replenishment would take less time thus reducing noise impacts. Notch fill construction activities are not expected to have adverse noise impacts.	Construction of seawalls on the beach during the day is not expected to exceed local noise ordinance limits. Impacts will be considered insignificant. Nighttime and weekend construction activities on beaches would exceed local ordinance limits and be performed under variance.	There would be no change to current noise levels.

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
Impacts from renourishment activities are expected to be similar as stated above.			
SOCIOECONOMICS			
There would be no significant direct impacts to the commercial and recreational fishery as a result of dredging. Impacts to kelp harvesting activities are expected to be insignificant. Beach fills will be conducted so as to not result in major beach closures. Recreational opportunities would not be significantly reduced and thus recreational economic impacts are insignificant. Impacts from renourishment activities are expected to be similar as stated above.	Impacts would be similar for those described for Alternative 1 for beach placement and dredging. The beach width would be smaller which will reduce the amount of time spent overall on dredging and placement activities. The notch fills construction activities are not expected to have adverse socioeconomic impacts. Impacts from renourishment activities are expected to be similar as stated for Alternative 1.	The seawall construction activities are not expected to have any socioeconomic impacts	There would be no change to current commercial or sport fisheries fluctuations.
TR**ANSPORTATION**			
No significant impacts are expected from this alternative, however local residents may experience a minor short-term increase in traffic. Impacts from renourishment activities are expected to be similar as stated above.	No significant impacts are expected from this alternative, however local residents may experience a minor short-term increase in traffic Impacts from renourishment activities are expected to be similar as stated above.	No significant impacts are expected from this alternative, however local residents may experience a minor short-term increase in traffic congestion.	As no beach replenishment or toe stabilization activities would occur, no trips would be generated.
LAND USE			
No significant impacts are expected due to construction activities. Existing land uses will be enhanced due to the anticipated protection of the bluff and resultant reduction in loss of property. Recreational areas will be enhanced. Impacts from renourishment activities are expected to be similar as stated above.	Impacts from beach replenishment and renourishment would be similar for those described for Alternative1. Construction of notch fill is not expected to have any impacts to land use.	Construction of seawalls is not expected to have any impacts to land use.	There would be a loss of land use and impacts to recreation under this alternative as a result of bluff failures.

Table ES-1.
Summary of potential environmental consequences.

Alternative 1 Beach Nourishment	Alternative 2 Beach Nourishment with Notch Fills	Alternative 3 Seawalls with Notch Fills	No Action Future Without Project
RECREATION			
Beach fills will be conducted so as to not result in major beach closures. Recreational opportunities would not be significantly reduced. Recreational impacts are expected to be insignificant. Impacts from renourishment activities are expected to be similar as stated above.	Impacts from beach replenishment and renourishment would be similar for those described for Alternative1. Construction of notch fills is not expected to have any impacts to recreation.	Construction of seawalls is not expected to have any impacts to recreation.	No recreational benefits would occur since no sand would be replenished on the beaches within the study area.
PUBLIC SAFETY			
During beach replenishment operations, safety measures would be implemented in the vicinity of the receiver beaches, including fencing, barricades, and flag personnel, as necessary. Access for emergency personnel to the beach and to the water will be maintained. Impacts to public safety are expected to be insignificant. Impacts from renourishment activities are expected to be similar as stated above.	Public safety impacts under this alternative would be similar to those described for Alternative 1. Construction of notch fills is not expected to have any impacts to public safety.	Construction of seawalls and notch fills is not expected to have any impacts to public safety.	No dredging or replenishment or toe stabilization activities would occur. At some receiver beaches, waves would continue to erode fragile bluffs that support property and structures. This erosion would continue unabated and may lead to significant impacts to health and safety as bluffs continue to erode and collapse. There have been four fatalities caused by collapsing bluffs in San Diego County in the last several years.
PUBLIC UTILITIES			
Public utilities located in or near the sand placement locations will be avoided and coordination with local utility companies will occur. No significant impact to public utilities is expected. Impacts from renourishment activities are expected to be similar as stated above.	Impacts from beach replenishment and renourishment would be similar for those described for Alternative 1. Construction of notch fills is not expected to have any impacts to public utilities.	Construction of seawalls is not expected to have any impacts to public utilities.	The beneficial effect of stabilizing structures such as stairways and outfalls would not occur under this alternative. Impacts to public utilities may result as a result of loss of bluff property.

Using this guidance, cumulative impacts were analyzed in consideration of other reasonable foreseeable projects in the vicinity of project areas. Cumulative projects considered in this analysis included other ongoing or proposed beach nourishment projects adjacent to the receiver sites; capital improvement or development projects proposed in areas adjacent to the receiver sites; and proposed actions planned for areas adjacent to the borrow sites. The results of this analysis concluded that significant cumulative impacts to air would occur as a result of implementing Alternatives 1 and 2, and that significant cumulative impacts to aesthetics would occur as a result of implementing Alternative 3. Table ES-2 shows the cumulative impact analysis for all alternatives.

Table ES-2.
Summary of cumulative environmental impacts.

Topography and Geology
No significant cumulative impacts would occur as a result of implementing Alternatives 1, 2, or 3.
Oceanographic and Coastal Processes
The impacts of beach nourishment to oceanic and littoral processes from sand placement under Alternative 1 and 2 will add to the cumulative impacts of other dredging projects that discharge sand to the beaches in northern San Diego County. When combined with the sand added to the littoral cell from implementation of Alternative 1 or Alternative 2, this total volume of sand could increase the potential of adversely impacting oceanographic and littoral processes, including nearshore wave characteristics, tides and currents, nearshore sediment transport, and shoreline erosion. However, these dredging projects involve the redistribution of sand that has been temporarily removed from the littoral cell and trapped within Oceanside Harbor or the coastal lagoons. Thus, the dredging and subsequent beach placement of sand from these small dredging projects represent a cyclic redistribution of sand within the littoral cell. As such, the sand redistributed within the littoral cell associated with these small dredging projects, when considered with Alternative 1 or Alternative 2, would not be expected to increase the potential for significant adverse impacts to oceanographic and littoral processes. There are no cumulative impacts associated with Alternative 3.
Water and Sediment Quality
The impacts of beach nourishment to water and sediment quality as a result of sand placement under Alternatives 1 and 2 will add to the cumulative impacts of other dredging projects that discharge sand to the beach in northern San Diego County. The sand discharged to beaches from these small dredging projects could potentially result in increased turbidity to the project area and, when added to the potential turbidity resulting from sand placement under Alternatives 1 and 2, could increase the potential for short-term decreased water quality conditions However, these impacts are expected to be insignificant. No significant water quality impacts are associated with Alternative 3, thus no significant cumulative impacts to water and sediment quality would result from implementation of Alternatives 3
Biological Resources
Impacts of beach nourishment to biological resources from sand placement under Alternatives 1 and 2 will add to the cumulative impacts of other dredging projects that discharge sand to the beach in northern San Diego County. The sand discharged to beaches from small dredging projects could potentially result in increased sand to the project area and, when added to the sand from Alternatives 1 or 2, could increase the potential that a sensitive habitat such as a kelp beds, surfgrass beds, or high relief reef could be buried. The placement of sand dredged from the adjacent lagoon inlets has only a very small localized effect. Therefore, the additional small dredging projects, when considered with Alternative 1 or Alternative 2, would not increase the potential for significant adverse impacts to sensitive habitats from sand burial. Impacts to marine resources of two or more simultaneous beach discharge projects would be insignificant except potentially to California least terns. The potentially significant impact of turbidity on least tern foraging could be reduced to insignificant either by monitoring turbidity and modifying operations if extensive turbidity occurred, or by scheduling beach discharge for Alternative 1 or Alternative 2 to occur at a receiver site that was not near Batiquitos Lagoon or San Elijo Lagoon during the period that those inlets were being dredged. No significant cumulative impacts to biological resources would result with implementation of Alternative 3, thus no significant cumulative impacts to biological resources would result with implementation of Alternatives 1, 2, or 3.
Cultural Resources
No significant cumulative impacts would result with implementation of Alternatives 1, 2, or 3.
Aesthetics
No significant negative cumulative impacts would result with implementation of Alternatives 1, or 2; the cumulative impact of wider beaches throughout the San Diego region is beneficial to aesthetics. Under Alternative 3, the cumulative impact of seawalls along the beach will be significant.

Table ES-2.
Summary of cumulative environmental impacts.

Air Quality
Construction and operation of cumulative projects will further degrade the local air quality. The greatest cumulative impact on the quality of regional air cell will be the incremental addition of pollutants generated by increased traffic due to residential, commercial, and industrial development, and the use of heavy equipment and trucks associated with the construction of these projects. Because the project area does not attain the daily ozone and PM10 standards, projects that are significant on a daily basis are also considered as significant on a cumulative basis. Both Alternatives 1 and 2 are projected to result in significant daily impacts for NOx, an ozone precursor. Additionally, exhaust emissions would exceed the daily PM10 threshold. Inclusion of the noted mitigation could reduce project-related PM10 impacts to less than significant levels. These measures could also substantially reduce NOx emissions and could be applied to all similar cumulative projects. Still, even with the application of all noted measures, project-generated NOx emissions would be expected to exceed the daily threshold and the project's contribution to the cumulative impact remains significant. No significant cumulative impacts to air quality are expected under Alternative 3.
Noise
All cumulative projects are located sufficiently far away and are of a short enough duration in any one area that their noise is not expected to measurably add to project-related noise. No significant cumulative impacts to noise receptors are expected with implementing of Alternatives 1, 2, or 3.
Socioeconomics
No significant cumulative impacts would result with implementation of Alternatives 1, 2, or 3.
Transportation
The short duration and the limited surface street activity associated with the projects result in no significant cumulative impacts to the local street system with the implementation of Alternatives 1, 2, or 3.
Land Use
No significant cumulative impacts to land use would result with implementation of Alternatives 1, 2, or 3.
Recreation
No two cumulative on-going maintenance projects would overlap and result in direct recreational impacts. There could be limited short-term significant cumulative impacts from overlapping summer recreational activities and this would require coordination with the local entities for scheduling of each project so as to minimize impact to recreational activities. Even though projects do not overlap, some portions of beaches may experience heavier use due to simultaneous actions. To avoid significant cumulative impacts, mitigation in the form of coordination between project proponents and the staggering of sand placement are required. Because implementation of Alternative 3 does not exclude large sections of the beach from recreation use and because each section is of short duration, there are no cumulative recreational impacts associated with Alternative 3.
Public Health and Safety
Safety measures associated with the alternatives include onshore and offshore closure to public access, safety buffer zones, onshore barricades, and safety personnel as necessary. Other beach nourishment projects would institute the same type of buffer zones and barricades. These safety measures would only be utilized on a short-term basis for the length of individual beach replenishment activities. Although seasonal lifeguard towers may need to be temporarily relocated during replenishment activities, impacts would not be significant. No cumulative impacts are expected to occur along the length of the pipeline since the pipe would be buried or spanned by access ramps at critical public and lifeguard access points. Navigational signage would be placed around a 500-foot buffer surrounding the borrow sites, as well as along floating or submerged sections of the sand transport pipe to alert boats to remain outside of the construction activities. If all the recommended precautions are taken, no cumulative impacts to public safety are expected to occur.
Public Utilities
Regional demand for existing utility services such as water, sewer, gas and electric, solid waste, and wastewater would not be incrementally increased by implementing the proposed action. Short-term cumulative interruption of services would be avoided by project-by-project monitoring efforts. It is not anticipated that any long-term disruption impacts would occur. Therefore, no cumulative impacts to utilities or structures are anticipated.

Effects Found Not to Be Significant

Issues that were brought forward for the proposed Encinitas and Solana Beach Shoreline Protection Project for further analysis and included in this Draft EIS/EIR included topography, geology and geography, oceanographic and coastal processes, water and sediment quality, biological resources, cultural resources, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. This analysis determined that the proposed project

would not have a long-term significant effect on these elements and the analyses of these issues are detailed in this document in Section 5.0.

Additionally, the draft feasibility study prepared for this project evaluated several issues found not to be significant and were therefore not analyzed in this Draft EIS/EIR, for example hazardous materials. Federal, state, and local regulatory databases were searched to determine whether any known contaminated sites are located in the study area. According to a search performed by Environmental Data Resources, Inc., no hazardous waste materials were found in the project area. Based on the research performed during the initial study, significant hazardous, toxic, or radioactive waste (HTRW) issues associated with the shoreline and borrow site activities are not expected.

Significant Unavoidable Adverse Effects

This EIS/EIR considered the potential impacts of the three proposed alternatives, in addition to the No Action Alternative, according to several resource categories: topography, geology and geography, oceanographic and coastal processes, water and sediment quality, biological resources, cultural resources, aesthetics, air quality, noise, socioeconomics, transportation, land use, recreation, public safety, and public utilities. Significant impacts have been identified for impacts to air quality under Alternatives 1 and 2 and aesthetics under Alternative 3.

Environmental Commitments

Table ES-3 shows the environmental commitments to be undertaken by the Corps to ensure environmental impacts are reduced to a level of insignificance where possible.

Table ES-3.
Summary of design features/monitoring commitments and mitigation measures (if necessary).

	Purpose	Timing	Implementation Responsibility
Design Features			
Topography, Geology, and Geography: Use of erodible concrete for notch fill material	Mimic natural erosive processes	During notch fill	Construction contractor
Oceanographic Characteristics and Coastal Processes: Use of erodible concrete for notch fill material	Mimic natural erosive processes	During notch fill	Construction contractor
Water and sediment quality: Construct "L"-shaped berms at all receiver sites	Anchor sand placement operations and reduce nearshore turbidity	During beach fill	Construction contractor
Water and sediment quality: Maintenance for land-based vehicles will occur in staging area away from beach and sensitive areas	Avoid minimal contamination from leaks, if any	During beach nourishment/notch fill	Construction contractor
Water and sediment Quality: Use proper BMPs during vehicle fueling	Avoid petroleum spills	During beach nourishment/notch fill	Construction contractor
Water and sediment quality: Generate plan for hazardous spill prevention and containment	Ensure minimal contamination from fuel leaks, if any	During operation of equipment on the beach or in the water	Construction contractor
Biological Resources: Design borrow sites to maintain adequate distance from artificial reefs, kelp, and other features	Avoid direct impacts to artificial reefs and kelp	Final engineering and during construction	Engineering contractor and construction contractor

Table ES-3.
Summary of design features/monitoring commitments and mitigation measures (if necessary).

	Purpose	Timing	Implementation Responsibility
Biology: Construct second transverse berm to begin a new cell if grunion spawning or eggs are encountered during construction	Section of beach with grunion would be avoided and bypassed	If grunion spawning or eggs are encountered	Construction contractor, in coordination with USACE
Biology: No construction shall be performed within 430 m of any sensitive bird species that have clear line of site to the construction area during breeding and nesting season; no beach construction within 215 m of any sensitive bird species during the breeding and nesting season	Minimize impacts to sensitive wildlife of noise emissions	During beach nourishment/notch fill	Construction contractor
Air quality: Use of BMPs to reduce air quality impacts such as the use of BACT and/or BART for the dredge	To reduce air emissions	During all construction activities	Construction contractor
Air quality: Construction equipment will be properly maintained and tuned	To reduce air emissions	During beach nourishment/notch fill	Construction contractor
Noise: Construction equipment shall be fitted with mufflers, air intake silencers, and engine shrouds; stationary noise sources will be located far from residential receptor locations	Minimize noise emissions	During beach nourishment/notch fill	Construction contractor
Noise: A noise variance shall be obtained for work done after 7 pm from the City of Encinitas and the City of Solana Beach	Public notification and approval	Prior to the commencement of any work	Construction contractor
Noise: In Reach 8, no beach construction shall be performed within 430 m (1,400 ft) of any sensitive bird species that have a clear line of sight to the construction area during the breeding and nesting season; and no beach construction shall be performed within 240 m (790 ft) of any sensitive bird species during the breeding and nesting season	Minimize impacts to sensitive wildlife of noise emissions	During beach nourishment/notch fill	Construction contractor
Aesthetics: Notch fill material will be colorized and textured to match the existing bluff face	Improve aesthetics of erodible concrete.	During notch fill	Construction contractor
Recreation: Communicate with local jurisdictions to avoid recreational events	Avoid disruption of established recreational events.	During beach nourishment/notch fill	Construction contractor
Public safety: Avoid placing fill material near storm drain outlets	Continue proper drainage	During beach nourishment/notch fill activities	Construction contractor, in coordination with City Engineer
Public safety: Generate plan for hazardous spill prevention and containment	Ensure minimal contamination from fuel leaks, if any	During operation of equipment on the beach or in the water	Construction contractor
Public Safety: Issue Notice to Mariners and maintain 500-foot buffer around active dredge equipment	Warn boaters/fishermen of dredging activities to ensure avoidance	Before and during dredging activities	Coast Guard (via construction contractor)
Public Safety: Generate safety plan to restrict public access at receiver and notch fill sites and maintain 45-m (150-foot) buffer around construction areas	Public safety during construction	During beach nourishment/notch fill activities	Construction contractor, in coordination with local lifeguards
Public Safety: Relocation of temporary lifeguard towers	Public safety during construction	During beach nourishment activities/notch fill	Construction contractor, in coordination with local lifeguards

Table ES-3.
Summary of design features/monitoring commitments and mitigation measures (if necessary).

	Purpose	Timing	Implementation Responsibility
Public Safety: Sand placement to avoid blocking line-of-sight at permanent lifeguard towers	Public safety during construction	During beach nourishment activities	Construction contractor, in coordination with local lifeguards
Socioeconomics: Coordination with commercial fishermen; establishment of offshore transit corridors in consultation with a commercial fishermen representative; issue Notice to Mariners	Avoid gear conflicts and provide for compensation if loss occurs	Before and during dredging operations	Coast Guard (via construction contractor) and USACE
Monitoring Commitments			
Water and Sediment Quality: Monitor turbidity levels	To avoid turbidity impacts to fish and aquatic species	During dredging operations and beach fill activities	
Biology: Conduct nearshore underwater surveys	Establish baseline data for comparison purposes and determine if any natural/biological resources/habitats have been adversely impacted by the project	Prior to construction and after construction	Qualified biologist
Biology: Monitor weekly for grunion spawning in construction area, establish buffer extending 30 m shoreward of high tide line and 30 m upcoast and downcoast (total 200 feet), until eggs hatch (minimum of one lunar month) and surveys show no subsequent spawning	Avoid grunion eggs and protect until hatched	April through September and per CDFG annual pamphlet *Expected Grunion Runs*.	Qualified biologist
Public Safety: Generate safety plan to restrict public access at receiver and notch fill sites and maintain 45-m (150-foot) buffer around construction areas	Public safety during construction	During beach nourishment/notch fill activities	Construction contractor, in coordination with local lifeguards
Post-Project Mitigation Measures (If Necessary)			
Biology: Restoration or creation of like habitat at a ratio to be determined with the responsible resource agencies according to the long-term significant impacts, if any, to marine resources	Mitigate for significant, long-term Impacts, if any, to sensitive marine resources caused by sediment placement or transport	Subsequent to resource agency review of monitoring reports and determination that significant impact had occurred	Qualified biologist

Required Permits

No Corps permits will be required for initial construction. Future 404 permits will be required for maintenance activities, which should use the EIS as the basis for issuing permits. The Corps will receive either a 401 water quality certification or a waiver from the Regional Water Quality Control Board (RWQCB) for the initial construction. The cities will be required to apply for Waste Discharge Requirements (WDRs) for maintenance activities from the RWQCB. The Corps will apply for initial Consistency Determination from the California Coastal Commission (CCC). Coastal Zone Consistency requirements for maintenance will depend on the status of the cities' local master plan. If beach maintenance is included then no further action should be required. If not, then individual coastal development permits may be required for each maintenance event. The Corps will apply for a lease from the California State Lands Commission (CSLC) for any portion of the project extending onto State-owned lands under its

jurisdiction, i.e., the tidelands and submerged lands in the project area. City permits include noise variances for both the initial construction and maintenance activities.

Other NEPA/CEQA Considerations

This section of the EIS/EIR addresses various other topics required by NEPA and CEQA for environmental review of the proposed action.

Short-term Uses and Long-term Productivity

Implementation of the proposed action (Alternative 2, Beach Nourishment with Notch Fills) would not result in any environmental impacts that would significantly narrow the range of beneficial uses of the environment or pose long-term risks to health, safety, or the general welfare of the public communities surrounding the receiver and construction sites. Rather, the project would provide protection from bluff erosion due to wave attack and would provide for future beneficial beach resources (e.g., recreational activities, sandy shoreline habitat, etc.).

Irreversible/Irretrievable Commitments of Resources

Resources which are irreversibly or irretrievably committed to a project are those that are typically used on a long-term or permanent basis; however, some are considered short-term resources that cannot be recovered and are thus considered irretrievable. These resources may include the use of non-renewable resources such as fuel, wood, or other natural or cultural resources. Human labor is also considered a nonretrievable resource because labor used for the proposed action would not be used for other purposes. The unavoidable destruction of natural resources which limit the range of potential uses of that particular environment would also be considered an irreversible or irretrievable commitment of resources.

The proposed action would result in the placement of approximately 939,000 m^3 (1,228 yd^3) of dredged beach-compatible fill material and 4,600 m^3 (6,000 yd^3) of erodible concrete notch fill. The project is necessary to protect the bluff from erosion and the existing beaches, which provide recreational opportunities not only for residents, but also contribute to the regional tourist industry. The proposed action would result in the consumptive use of nonrenewable energy sources and labor required to operate dredges, trucks, pumping equipment, and grading equipment. These commitments of resources could have otherwise been applied to projects other than the proposed action. However, the proposed action would not result in the use of a substantial amount of resources. Additionally, no natural resources would be permanently destroyed and beach replenishment and bluff protection would be considered beneficial to the region.

Growth Inducement

A benefit of the proposed action would be the enhancement or continuation of the recreational usage of each of the receiving shoreline segments. The resulting temporary recreational benefits derived from the additional beach area would not be expected to increase the demand for public services and utilities, nor create a need for additional recreational facilities above current projections.

Protection of Children from Environmental Health and Safety Risks

There would be no disproportionate impacts to children during implementation of the proposed action. No significant impacts would occur and there is no indication that any impacts would disproportionately accrue to children. Areas of replenishment and construction would be restricted during project implementation for safety reasons and no long-term effects would occur after the beach areas were reopened for public use.

Environmental Justice

Implementation of Alternative 2 would not have a disproportionate impact on minority populations or low-income populations because the areas encompassed by the project sites do not include disproportionately high minority populations or low-income populations compared to the contiguous cities or the county.

Essential Fish Habitat

The proposed action would not result in long-term or significant effects to sustainable fisheries present in the Coastal Pelagics or Pacific Groundfish Fish Management Plans. During dredging activities, fish would be expected to move from the area of active dredging and then return once construction activities are completed. These species would not be lost to the ecosystem nor would migration patterns be affected. Fish that feed on benthic organisms may experience some short-term loss of forage area and prey species, but because the active area of dredging is small compared to most fish forage ranges, this affect is not expected to be significant. All dredging operations would be performed in conformance with the permit conditions established by the Water Quality Certification (401) permit issued by the RWQCB to control turbidity.

Areas of Controversy

Three areas of controversy or potential controversy may be expected with this proposal.

(1) Anytime a project is considered that has the potential to disrupt natural wave dynamics along the shoreline and sand supplies, the potential for disrupting wave shore breaks will also exist. This potential impact will likely affect a portion of the community that is interested in aquatic recreational activities such as swimming and surfing and is expected to be a source of controversy related to the proposed alternatives.

(2) In addition, many of the analyses conducted in this evaluation rely heavily on the work conducted to support the SANDAG regional beach replenishment program which was recently implemented in the areas under consideration in this EIS/EIR. However, because the proposed alternatives for this study include the placement of much greater sand volumes on the beach, it is expected that some agencies and individuals may not agree with the comparison of impact potential between the two studies.

(3) Lastly, the study area for this project includes shoreline reaches adjacent to the current entrance of San Elijo Lagoon, raising the potential for increased maintenance activities being required to keep the channel entrance free of sand so that sufficient tidal exchanges to the Lagoon can occur. It is expected that some members of the community will take issue with this potential impact and with the conclusion reached by the environmental analysis.